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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/000.001	10/24/2001	Jianmin Wang	8033064	3241

7590 10/09/2003

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EXAMINER
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CONNOLLY, PATRICK J

ART UNIT	PAPER NUMBER
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2877

DATE MAILED: 10/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/000,001	WANG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Patrick J Connolly	2877	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is *non-final*.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____. | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-13, 16 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,019,818 to Vilkomerson.

As to claims 1, 12, 16, and 18-20, Vilkomerson teaches an interferometer for determining the displacement of a mirror insonified by an ultrasonic wave including (see Figures 1, 2b):

- a laser configured to provide a beam of linearly polarized light (100);
- a polarizing beamsplitter for splitting the beam into orthogonal polarized components, one being a reference beam, the other being an object beam (204);
- a mirror positioned to reflect the reference beam back (110);
- a surface whose displacement is to be measured (114);
- the polarizing beam splitter is positioned to recombine the reflected object and reference beams;
- a non polarizing beam splitter to receive said combined beam and to split said beam into a first and second output beam (216);
- a quarter waveplate positioned to receive the first output beam (220);
- a first polarizer positioned to receive the phase-shifted first output beam (218b);
- a second polarizer positioned to receive the second output beam (218a);

a first detector (300-1); and  
a second detector (300-2).

While Vilkomerson does not teach this interferometer for detecting the displacement of a disc surface, it would have been obvious to one of ordinary skill in the art at the time of invention to do so, as the measurement process would be identical.

As to claims 2 and 3, while Vilkomerson does not teach using a half-wave plate in combination with the polarizing beam splitter, it is well known in the art that a half-wave plate can be used to rotate polarizations, and further it would have been obvious to one of ordinary skill in the art at the time of invention to include a half-wave plate in the apparatus of Vilkomerson so that the rotation of the polarization of the input beam could be controlled.

As to claim 4, while Vilkomerson does not teach using a lens to reduce the spot size of the object beam, it would have been obvious to one of ordinary skill in the art at the time of invention to include such a lens in the apparatus of Vilkomerson in order to improve resolution.

As to claim 5, Vilkomerson teaches first and second quarter-wave plates (208, 212) positioned to receive the reflected beams.

As to claim 6, Vilkomerson teaches a ninety-degree phase shift.

As to claim 7 and 13, Vilkomerson teaches an information processing system coupled to the detectors, configured to provide a display output of temporal variations in light intensity in parallel and phase quadrature (118).

As to claim 8 and 13, Vilkomerson teaches an information processor coupled to the detectors and configured to display output of temporal interference fringes (118, see column 6 and 7);

As to claims 9-11, while Vilkomerson does not teach a specific phase unwrapping system, the process of phase unwrapping is well known, and it would have been obvious to one of ordinary skill in the art to include an information processor in the interferometer of Vilkomerson to perform said phase unwrapping analysis on the signal.

Claims 14, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,710,631 to Bou-Ghannam et al.

As to claims 14, 15 and 17, Bou-Ghannam teaches a method for analyzing defects including (see columns 25, 26 and 27): determining phase angles from multiple detectors; applying a phase unwrapping process including adding positive and negative values of a constant; and determining displacement caused by variations in a disc surface.

#### ***Double Patenting***

Applicant is advised that should claim 1 be found allowable, claim 16 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick J Connolly whose telephone number is 703.305.4397. The examiner can normally be reached on 9 am-5.30 pm ... Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 703.308.4881. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0956.

pjc f 10



Samuel A. Turner  
Primary Examiner